

WHAT IS CLAIMED IS:

1. An isolated polynucleotide comprising a nucleic acid at least 90% identical to a reference nucleotide sequence selected from the group consisting of:

- (a) SEQ ID NO: 4,
- (b) SEQ ID NO: 5,
- (c) SEQ ID NO: 6,
- (d) SEQ ID NO: 7,
- (e) SEQ ID NO: 8,
- (f) SEQ ID NO: 9,
- (g) SEQ ID NO: 10,
- (h) SEQ ID NO: 11,
- (i) SEQ ID NO: 12,
- (j) SEQ ID NO: 13,
- (k) SEQ ID NO: 14,
- (l) SEQ ID NO: 15,
- (m) SEQ ID NO: 16,
- (n) SEQ ID NO: 17,
- (o) SEQ ID NO: 18,
- (p) SEQ ID NO: 19,
- (q) SEQ ID NO: 20,
- (r) SEQ ID NO: 21, and
- (s) SEQ ID NO: 22.

2. The polynucleotide of claim 1, wherein said polynucleotide regulates transcription of β -galactosidase in a bacterial host cell.

3. The polynucleotide of claim 1, wherein the sequence of said nucleic acid is identical to said reference nucleotide sequence.

4. The polynucleotide of claim 1, further comprising a second nucleic acid.

5. The polynucleotide of claim 4, wherein said second nucleic acid encodes a polypeptide.

6. The polynucleotide of claim 5, wherein said polypeptide is selected from the group consisting of:

(a) a polypeptide which is a component of an amino acid biosynthesis pathway;

(b) a polypeptide which is a component of a purine nucleotide biosynthesis pathway; and

(c) a heterologous polypeptide.

7. The polynucleotide of claim 6, wherein said polypeptide is a component of an amino acid biosynthesis pathway.

8. The polynucleotide of claim 7 wherein said amino acid biosynthesis pathway is a lysine biosynthesis pathway.

9. The polynucleotide of claim 7, wherein said polypeptide is selected from the group consisting of:

(a) aspartokinase,

(b) diaminopimelate dehydrogenase,

(c) diaminopimelate decarboxylase,

(d) dihydrodipicolinate synthetase,

(e) dihydrodipicolinate reductase,

(f) aspartate beta-semialdehyde dehydrogenase, and

(g) pyruvate carboxylase.

10. A method of producing a vector which comprises inserting the polynucleotide of claim 1 into a vector.

11. A vector comprising the polynucleotide of claim 1.

12. A vector comprising the polynucleotide of claim 4.

13. A vector comprising the polynucleotide of claim 6.

14. A host cell comprising the vector of claim 11.

15. The host cell of claim 14, wherein said host cell is a *Corynebacterium* species.

16. A host cell comprising the vector of claim 12.

17. A host cell comprising the vector of claim 13.

18. A method of producing a transformed *Corynebacterium* species host cell comprising:

(a) introducing into *Corynebacterium* species cells the vector of claim 17, and

(b) selecting said host cell.

19. A method of production of a biosynthetic product, comprising culturing the host cell of claim 18 in or on a culture medium, and recovering said product.

20. An isolated polynucleotide comprising a nucleic acid which hybridizes to a reference nucleic acid, or the complement thereof, wherein the sequence of said reference nucleic acid is selected from the group consisting of:

- (a) SEQ ID NO: 4,
- (b) SEQ ID NO: 5,
- (c) SEQ ID NO: 6,
- (d) SEQ ID NO: 7,
- (e) SEQ ID NO: 8,
- (f) SEQ ID NO: 9,
- (g) SEQ ID NO: 10,
- (h) SEQ ID NO: 11,
- (i) SEQ ID NO: 12,
- (j) SEQ ID NO: 13,
- (k) SEQ ID NO: 14,
- (l) SEQ ID NO: 15,
- (m) SEQ ID NO: 16,
- (n) SEQ ID NO: 17,
- (o) SEQ ID NO: 18,
- (p) SEQ ID NO: 19,
- (q) SEQ ID NO: 20,
- (r) SEQ ID NO: 21, and
- (s) SEQ ID NO: 22;

wherein said first nucleic acid is at least 30 nucleotides in length.

21. The polynucleotide of claim 20, wherein said polynucleotide regulates transcription of β -galactosidase in a bacterial host cell.

22. An isolated polynucleotide comprising a nucleic acid, the sequence of which comprises 10 contiguous nucleotides of a reference sequence selected from the group consisting of:

- (a) SEQ ID NO: 4,
- (b) SEQ ID NO: 5,
- (c) SEQ ID NO: 6,
- (d) SEQ ID NO: 7,
- (e) SEQ ID NO: 8,
- (f) SEQ ID NO: 9,
- (g) SEQ ID NO: 10,
- (h) SEQ ID NO: 11,
- (i) SEQ ID NO: 12,
- (j) SEQ ID NO: 13,
- (k) SEQ ID NO: 14,
- (l) SEQ ID NO: 15,
- (m) SEQ ID NO: 16,
- (n) SEQ ID NO: 17,
- (o) SEQ ID NO: 18,
- (p) SEQ ID NO: 19,
- (q) SEQ ID NO: 20,
- (r) SEQ ID NO: 21, and
- (s) SEQ ID NO: 22.

23. The polynucleotide of claim 22, wherein said polynucleotide regulates transcription of β -galactosidase in a bacterial host cell.

24. The polynucleotide of claim 22, wherein the sequence of said first nucleic acid comprises 20 contiguous nucleotides of any of said sequences.

25. The polynucleotide of claim 24, wherein the sequence of said first nucleic acid comprises 50 contiguous nucleotides of any of said sequences.

26. The polynucleotide of claim 25, wherein the sequence of said first nucleic acid comprises 150 contiguous nucleotides of any of said sequences.

27. The polynucleotide of claim 24, further comprising a second nucleic acid.

28. The polynucleotide of claim 27, wherein said second nucleic acid encodes a polypeptide.

29. The polynucleotide of claim 28, wherein said polypeptide is selected from the group consisting of:

(a) a polypeptide which is a component of an amino acid biosynthesis pathway;

(b) a polypeptide which is a component of a purine nucleotide biosynthesis pathway; and

(c) a heterologous polypeptide.

30. The polynucleotide of claim 29, wherein said polypeptide is a component of an amino acid biosynthesis pathway.

31. A method of producing a vector which comprises inserting the polynucleotide of claim 22 into a vector.

32. A vector comprising the polynucleotide of claim 22.

33. A vector comprising the polynucleotide of claim 27.

34. A host cell comprising the vector of claim 32.

35. The host cell of claim 34, wherein said host cell is a *Corynebacterium* species.

36. A host cell comprising the vector of claim 33.

37. A method of producing a transformed *Corynebacterium* species host cell comprising:

- (a) introducing into *Corynebacterium* species cells the vector of claim 33, and
- (b) selecting said host cell.

38. A method of production of a biosynthetic product, comprising culturing the host cell of claim 36 in or on a culture medium, and recovering said product.

39. An isolated *Corynebacterium* species chromosome, comprising:
a first nucleic acid integrated into said chromosome, the sequence of which is at least 90% identical to SEQ ID NO:1, and
a second nucleic acid integrated into said chromosome, wherein said second nucleic acid encodes a polypeptide which functions as a component of an amino acid biosynthesis pathway; and
wherein said first nucleic acid regulates transcription of said second nucleic acid.

40. The *Corynebacterium* species chromosome of claim wherein the sequence of said first nucleic acid is identical to SEQ ID NO:1.

41. A host cell comprising the *Corynebacterium* species chromosome of claim 39.

42. A method of producing the *Corynebacterium* species host cell of claim 41, comprising:

(a) transforming *Corynebacterium* species cells with a vector comprising a first nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO: 1, wherein said vector facilitates integration of said first nucleic acid into the chromosome of said *Corynebacterium* species cells, and

(b) selecting said host cell.

43. A vector comprising the first and second polynucleotide of claim 39.

44. The vector of claim 43, wherein said second nucleic acid encodes a polypeptide which functions as a component of an amino acid biosynthesis pathway; and

wherein said first nucleic acid regulates transcription of said second nucleic acid.

45. A method of production of an amino acid, comprising culturing the host cell of claim 41 in or on a culture medium, and recovering said amino acid.

46. An isolated polynucleotide comprising:

a first nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO: 2, and

a second nucleic acid operably associated with said first nucleic acid, wherein said second nucleic acid encodes polypeptide which functions as a component of a lysine biosynthesis pathway;

wherein said first nucleic acid regulates transcription of said second nucleic acid.

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47. The isolated polynucleotide of claim 46, wherein the sequence of said first nucleic acid is identical to SEQ ID NO:2.

48. A method of producing a vector, comprising inserting the polynucleotide of claim 47 into a vector.

49. A vector comprising the polynucleotide of claim 46.

50. A host cell comprising the vector of claim 49.

51. A method of producing a transformed *Corynebacterium* species host cell comprising:

(a) introducing into *Corynebacterium* species cells the vector of claim 49, and

(b) selecting said host cell.

52. An isolated polynucleotide comprising:
a first nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO: 3; and

a second nucleic acid operably associated with said second nucleic acid, wherein said second nucleic acid encodes polypeptide which functions as a component of an amino acid biosynthesis pathway;

wherein said first nucleic acid regulates transcription of said second nucleic acid.

53. The isolated polynucleotide of claim 52 wherein the sequence of said first nucleic acid is identical to SEQ ID NO:3.

54. A method of producing a vector, comprising inserting the polynucleotide of claim 52 into a vector.

55. A vector comprising the polynucleotide of claim 52.

56. A host cell comprising the vector of claim 55.

57. A method of producing a transformed *Corynebacterium* species host cell comprising:

- (a) introducing into *Corynebacterium* species cells the vector of claim 55, and
- (b) selecting said host cell.

58. A method of production of an amino acid, comprising culturing the host cell of claim 56 in or on a culture medium, and recovering said amino acid.

59. An isolated *Corynebacterium* species chromosome, comprising:
a first nucleic acid integrated into said chromosome, the sequence of which is at least 90% identical to SEQ ID NO:23, and

a second nucleic acid integrated into said chromosome in operable association with said first nucleic acid, wherein said second nucleic acid encodes polypeptide which functions as a component of an amino acid biosynthesis pathway;

wherein said first nucleic acid regulates transcription of said second nucleic acid.

60. The *Corynebacterium* species chromosome of claim 59, wherein the sequence of said first nucleic acid is identical to SEQ ID NO:23.

61. A *Corynebacterium* species host cell comprising the *Corynebacterium* species chromosome of claim 59.

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62. A method of producing the *Corynebacterium* species host cell of claim 61, comprising:

(a) transforming *Corynebacterium* species cells with a vector comprising a first nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO: 23, wherein said vector facilitates integration of said first nucleic acid into the chromosome of said *Corynebacterium* species cells, and

(b) selecting said host cell.

63. A vector comprising the *Corynebacterium* species chromosome of claim 59.

64. A method of production of an amino acid, comprising culturing the host cell of claim 61 in or on a culture medium, and recovering said amino acid.

65. The method of claim 64, further comprising adding arabinose to said culture medium.

66. The method of claim 65, wherein said first polynucleotide facilitates enhanced production of said amino acid in the presence of arabinose.

67. An isolated *Corynebacterium* species chromosome, comprising:
a first nucleic acid integrated into said chromosome, the sequence of which is identical to a nucleotide sequence selected from the group consisting of

(a) SEQ ID NO:26, and

(b) SEQ ID NO:27,

a second nucleic acid integrated into said chromosome in operable association with said first nucleic acid, wherein said second nucleic acid encodes

polypeptide which functions as a component of an amino acid biosynthesis pathway; and

a third nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO:28;

wherein said first nucleic acid regulates transcription of said second nucleic acid, and wherein said third nucleic acid encodes a lac repressor polypeptide, wherein said third nucleic acid is in operable association with said first nucleic acid.

68. The *Corynebacterium* species chromosome of claim 67, wherein the sequence of said third nucleic acid is identical to SEQ ID NO:28.

69. The *Corynebacterium* species chromosome of claim 67, wherein said third nucleic acid is operably associated with a transcriptional regulatory region.

70. A *Corynebacterium* species host cell comprising the *Corynebacterium* species chromosome of claim 67.

71. A method of producing the *Corynebacterium* species host cell of claim 70, comprising:

(a) transforming *Corynebacterium* species cells with a vector comprising:

(i) a first nucleic acid, the sequence of which is selected from the group consisting of SEQ ID NO:26 and SEQ ID NO:27; and

(ii) a third nucleic acid, the sequence of which is at least 90% identical to SEQ ID NO:28, operably associated with a transcriptional regulatory region, wherein said third nucleic acid encodes a lac repressor polypeptide; and

wherein said vector facilitates integration of said first and third nucleic acids into the chromosome of said *Corynebacterium* species cells, and

(b) selecting said host cell.

72. A vector comprising the first, second and third nucleic acid of claim 67.

73. A method of production of an amino acid, comprising culturing the host cell of claim 70 in or on a culture medium, and recovering said amino acid.

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